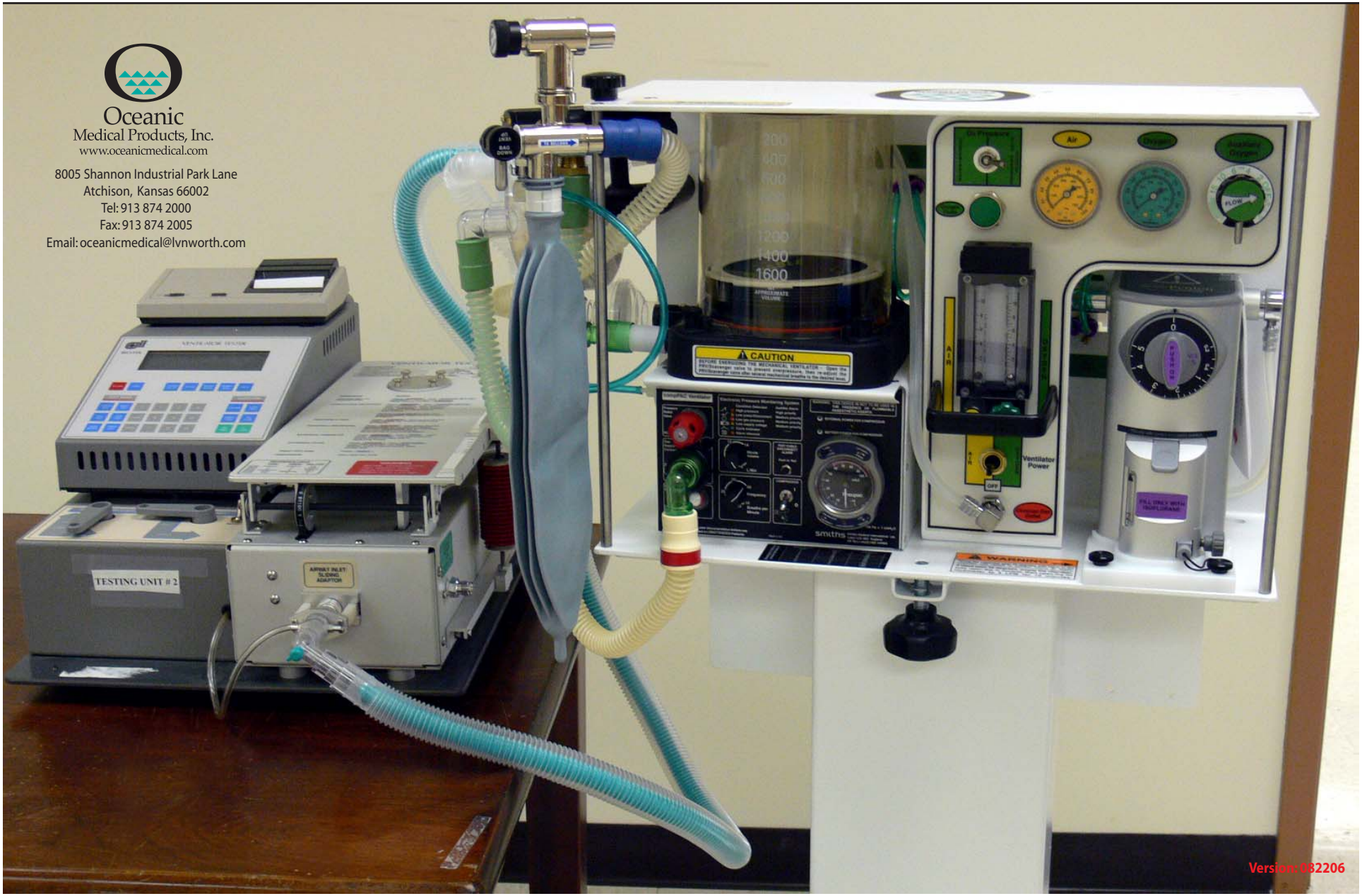
Magellan-2200 Model 2 Anesthesia Machine Service Manual



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FACTORY ADDRESS AND COMMUNICATION INFORMATION

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PURPOSE OF THIS DOCUMENT

This Service Manual provides the reader with important information concerning the general service, maintenance and general repair of the Magellan-2200, Model 2 Anesthesia Machine.

This manual will allow for the service of the Magellan-2200, Model 2 Anesthesia Machine and its accessories. This machine may be fully serviced outside of the factory and the reader may contact the factory at any time for assistance.

GENERAL POLICY STATEMENT

The scope of this manual covers general maintenance, calibration of controls, disinfecting procedures and replacement of certain components at the intervals indicated within this document.

FACTORY TESTING

Each Magellan-2200, Model 2 Anesthesia Machine is tested utilizing certain testing equipment which may or may not be available in the field or in a general biomedical maintenance facility. This manual will explain how the Operator and Biomedical Technician may completely and safely maintain this equipment.

USE AND OPERATION

The use and operation of the Magellan-2200, Model 2 anesthesia machine should be performed by a physician, anesthesiologist or certified registered nurse anesthetist (CRNA) trained properly with this device.

EQUIPMENT NEEDED FOR BENCH TESTING

1. **Operators Manual**
2. **Pre-Use Check List:** Contained in this manual, the Operators Manual and Separate Laminated Card
3. **Regulated, Pressurized Gas Sources:** Wall outlets for oxygen and air, gas cylinders for oxygen and air, each with appropriate pressure-reducing regulators, portable medical grade air compressor and oxygen concentrator.
4. **Mechanical or Electrical-Mechanical Test Lung:** The factory utilizes the Bio-Med VT-2A Test Lung, however, other brands of such devices may be used for bench testing

5. Hand-Operated Spirometer: May be used for gas volume calibration if other mechanical test lungs are not available.

6. **Rubber Test Lung or Any One Liter Rubber Test Lung or One Liter Gas Reservoir Bag:** Used to simulate patient delivered gas volumes if mechanical Test Lung is not available.

7. **Carbon Dioxide Absorber:** King Systems KAB-9 unit, either full of absorbent or empty.

8. **Patient Tubing Circuit:** Any approved Patient Tubing Circuit for Anesthesia may be utilized.

9. **Monitoring Device for Anesthetic Agent:** Either a specific vaporized agent testing device such as a Bickford Anesthesia Agent Tester, Model-3, or an anesthesia monitor capable of measuring vaporized agent may be used.

10. **Tools:** The Magellan-2200, Model 2 Anesthesia Machine was designed to be serviced with the following common tools:

A. 1/16" Allen's Wrench-used with O2 flowmeter control knob and the three ventilator control knobs.

B. Screwdriver, regular slotted head.

C. Small, adjustable crescent wrench, or:

1. 1/2" open head wrench
2. 7/16" open head wrench
3. regular pliers

D. 1" sealing tape roll

E. Tube of Krytox (or other oxygen compliant) lubricant

F. Water-based leak testing solution

ANNUAL MAINTENANCE, PARTS NEEDED AND TESTING

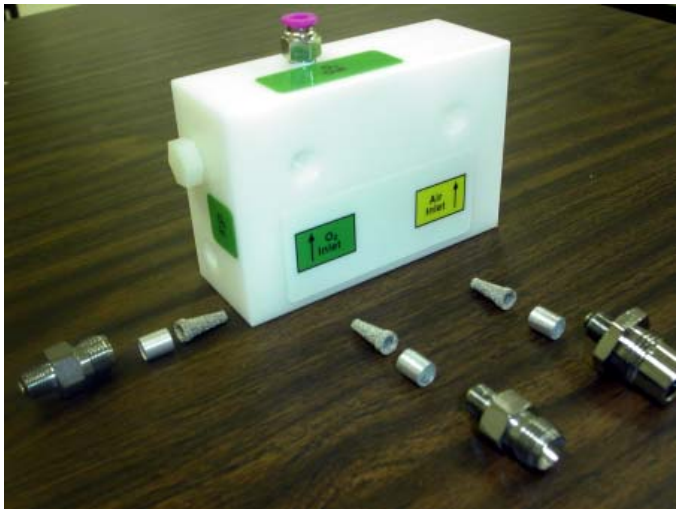
Recommended Inspection/Replacement of Certain Components

A. **Annually:** The following procedures should be used to ensure proper operation of the machine, at least once per year or at any other interval that the Biomedical Technician deems necessary.

B. **Parts Needed:** The following parts will be needed for Annual Service

- Inlet Filters (2 each) P/N **11.3**
- Bellows, Latex-free, P/N **13.1**

1. Changing the Gas Manifold Inlet Filters:



Air (DISS) Inlet Connector:

A. Using a crescent wrench, unscrew the DISS Air inlet connector and remove.

B. Remove the filter spacer (aluminum ring) then remove the cone-shaped filter.

C. Inspect the filter for debris. If debris is found, remove it.

D. Install the filter back into the Gas Manifold (with original or new filter) with the small end first.

E. Install the filter spacer (aluminum ring).

F. Pull open the one-way valve (located on the end of the threaded portion of the DISS adapter), and apply some Krytox (or, equivalent) lubricant.

G. Re-tape the DISS Air connector, threaded portion, with sealant tape.

H. Re-install the DISS Air connector, screwing it closed, snugly, with the crescent wrench.

Oxygen (DISS) Inlet Connectors:
(the first one is located next to the Air Connector, the second one is located on the left-hand side of the Gas Manifold and the procedure is identical for both Oxygen DISS Inlet connectors.)

A. Using a crescent wrench, unscrew the DISS Oxygen.

B. Remove the filter spacer (aluminum ring) then remove the cone-shaped filter.

C. Inspect the filter for debris. If debris is found, remove it.

D. Install the filter back into the Gas Manifold (with original or new filter).

E. Install the filter spacer (aluminum ring).

F. Pull open the one way valve (located on the end of the threaded portion of the DISS adapter) and apply some Krytox (or, equivalent) lubricant.

G. Re-tape the DISS Oxygen connector, threaded portion, with sealant tape.

H. Re-install the DISS Oxygen Connector(s), screwing it closed, snugly, with the crescent wrench.

2. Replacement of Rubber Bellows and Inspection of Exhalation Diaphragm Valve

A. Removal of Ventilator and Bellows Systems from Main Frame:

1. Turn anesthesia machine on the Vaporizer side of the machine.

2. Using a flat head screwdriver, remove the ventilator retaining screw.

3. Lay the machine down in its normal operating position.

4. Remove the two retaining knob/screws on the backside of the ventilator.

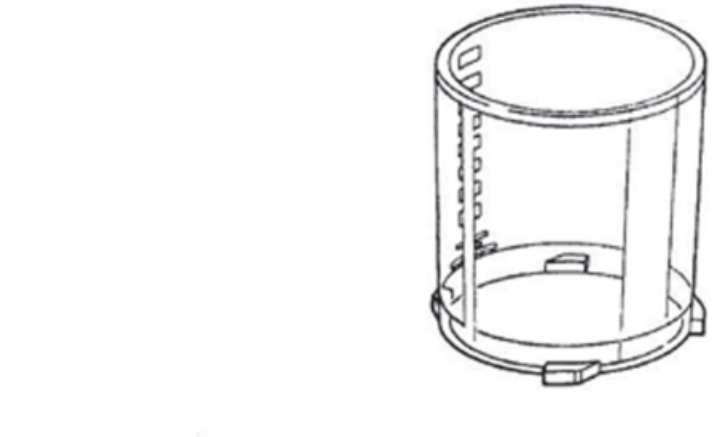
5. Disconnect the ventilator gas power tubing from the Ventilator GasPower Toggle Selector Switch by pushing in on the tubing and simultaneously pushing inwards on the retainer ring located on the tubing inlet receptacle.

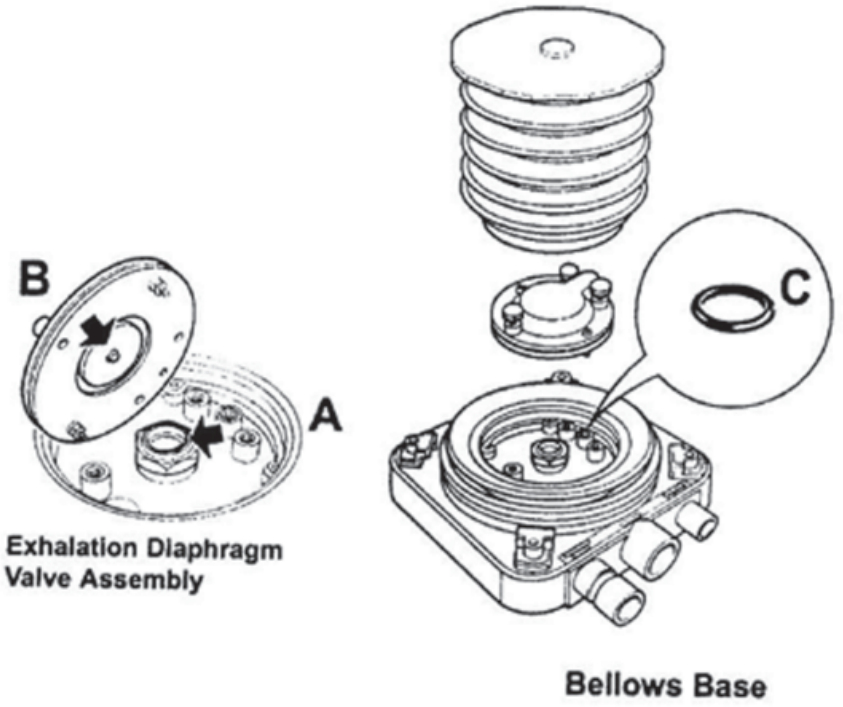
6. Remove the ventilator/bellows system by pulling the assembly forward from the main frame.

B. Removal of Rubber Bellows from Bellows Base, Inspection of Exhalation Valve Diaphragm Valve and Installing New Bellows

1. Turn the clear plastic bellows canister cover **counter-clockwise** until the four plastic retainer parts are clear of the black plastic retainers, (located on the top of the base of the bellows assembly) and gently remove the clear plastic bellows canister cover, using an upwards motion.

2. Remove the rubber bellows from the Bellows Base.





3. Each time the bellows assemblies are opened for inspection and cleaning, all visible components must be carefully inspected and damaged parts must be replaced.

Bellows: The bellows is an elastomer material and deteriorates over time. Inspect the bellows every six months if the system is in use. Inspect on the appropriate schedule (annual, to a period of 3 years) if the system is in long term storage. Replace the bellows if there is any sign of deterioration.

Exhalation Valve Diaphragm: The exhalation valve diaphragm valve is under the bellow and can be removed by loosening the three thumbscrews. The valve seat is now visible.

WARNING: During inspection and cleaning (to remove contamination) of the valve seat and diaphragm, use a soft cloth or brush. Abrasive materials may damage the seat and should not be used. To preclude damage caused by the patient breathing into the valve, you should use a bacterial filter in the expiratory breathing circuit.

Clean the seat (**A**) and the metal disk (**B**) attached to the base of the diaphragm valve thoroughly and remove any contamination from the surfaces of both components.

NOTE: Any anesthesia breathing circuit filter may be used.

After cleaning, check the small O-Ring (**C**) located in the bellows base under the diaphragm valve is in place. The system will not function if the O-Ring is not in place.

Refit the diaphragm valve assembly to the bellows base and reassemble the bellows assembly.

4. Install new bellows to bellows base by placing the bottom bellows crease over the lip of the bellows retainer. **(See photos to the right.)**

NOTE: Once the bellows is installed, turn the vent/bellows system upside down and observe that the bellows fully expand and the folds are evenly opened. Re-adjust the bellows fold where it is attached to the base and re-observe the expansion.

5. Using Krytox (or equivalent lubricant) place a small amount of the lubricant on the hard plastic top ring of the bellows.

6. Using Krytox (or equivalent lubricant) place a small amount of the lubricant on the bottom ring of the clear plastic bellows canister cover.

7. Re-install the clear plastic bellows canister cover by pushing the clear canister down firmly over the bellows base, then turning the canister cover clockwise until the retainers are completely covered by the retainer clips.

8. Re-install the ventilator/bellows system:

   A. Place the ventilator/bellows system partially in place.

   B. Re-install the ventilator power tubing into the Gas Selector Switch receptacle by pushing the tubing firmly into the receptacle, then pulling the tubing backwards, firmly.

   C. Push the ventilator/bellows system back into its normal position.

   D. Re-install the two ventilator base knob-screws from the backside of the machine frame.

   E. Turn the entire machine onto the vaporizer side of the system.

   F. Re-install the ventilator retaining screw into the bottom of the ventilator through the bottom of the machine frame.

3. Mandatory Replacement of Gas Manifold - High Pressure Color-Coded Tubing

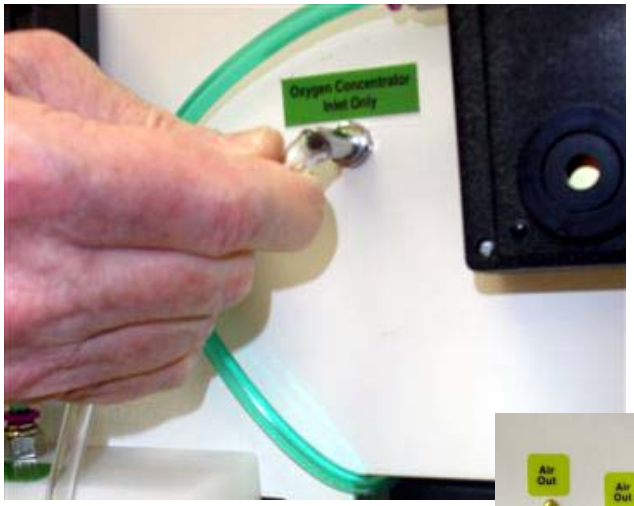
Every five years or, at any necessary time, each of the 10 color-coded tubes that attaches to/from the Gas Manifold should be replaced using the following procedure:

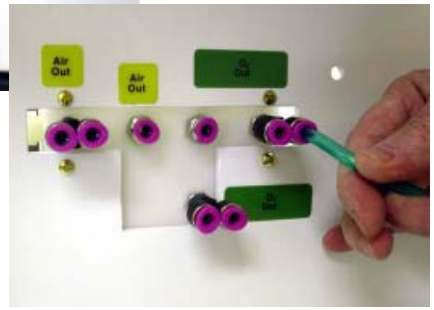
NOTE: The end of the color-coded tubing must be squarely cut; angled ends may not seat properly.

A. Green (oxygen) and Yellow (Air) Tubing: The connectors from the Gas Manifold to each of the following components are of the "push-to-insert-and-lock" type.

B. To dismount, push in on the outer ring and pull the tubing out.

C. To re-insert, push the end of the green tubing into the receptacle and then use a "pulling" action to lock the tube in place.





Green Tubing Positions From Gas Manifold to:

A. Auxiliary O2 Flow Selector

B. O2 Pressure Gauge

C. O2 Flush Valve

D. O2 Flowmeter

E. O2 Position on Ventilator Gas Selector Toggle Switch

F. O2 Concentrator/High Pressure O2 Selector Toggle Switch

G. O2 Low Pressure Alarm

H. O2 Very Low Pressure / O2 Concentrator Pressure Alarm

Yellow Tubing Positions From Gas Manifold to:

A. Air Pressure Gauge

B. Air Position on the Ventilator Gas Selector Toggle Switch

C. Air Flowmeter

II. ROUTINE FUNCTIONAL TEST : The functional test may be done at annual intervals or at any time that internal componenets have been replaced.

NOTE: The Routine and Annual Functional Test may be carried out at any interval. This test will indicate any malfunction of the machine or its components and the Operator or Biomedical Technician will be able to rectify any component that is not functioning properly.

Test Procedure:

1. Assemble and install all components needed for routine clinical use of the machine as outlined in the Operators Manual, or the Laminated Set-Up Card.
2. Perform the Pre-Use Checklist and Laminated Set-Up Card (with photos) in sequence. This Checklist is contained in the Operators Manual; the separate Pre-Use Checklist laminated card and Set-Up Card are provided with each machine.

NOTE: If the machine passes the Pre-Use Checklist with zero problems, proceed to the Calibration Guide in the next section.

CAUTION: If the machine does not pass the Pre-Use Checklist, correct the problem(s) encountered, then proceed with the Calibration Guide. The Problem Solving Guide on page 13 of this Manual will assist the Operator in resolving possible common problem situations.

Calibration Guide:

CAUTION: The factory utilizes pressurized Air and Oxygen set at 50 PSI for all testing. It is recommended that this pressure be used when possible. If higher or lower inlet pressures are routinely utilized the ventilator may be re-calibrated at pressure inputs from 40 to 70 PSI.

Calibration Materials Required:

- Source gas of air or oxygen
- Appropriate hose set to connect to gas source
- Pre-Use Checklist
- Operating Ventilator
- Test Lung
- Patient Tubing Circuit

Procedure:

- Attach the patient circuit to the equipment and to the test lung.
- Set Minute Volume control knob to 10 LPM.
- Set Frequency conrol knob to 13 BPM.
- Ensure the bellows is fully inflated.
- Pressurize the ventilator and allow the system to cycle several times.
- Verify the following values on the test lung:

  Minute Volume = 10 LPM
  BPM = 13 per minute
  Tidal Volume = 770 MI

NOTE: Values should be +/- 10% of settting.

2. **Ventilator Gas Power Toggle Switch -** Select either Air or Oxygen as the power source.

NOTE: Ensure that the Oxygen system toggle switch is in the high-pressure position.

3. **Re-Calibration of Individual Control Knobs**

Tools needed: Test Lung.

A. Remove Control Knob by grasping the knob firmaly and pulling it straight off the shaft.

B. With the ventilator still cycling, turn the valve shaft until the proper value is shown on the test lung.

C. Replace the Control Knob by facing the pointer to the desired value and pushing it straight on to its full extent.

D. Verify the values are now correct.

NOTE: The results of calibration can vary depending on the test lung utilized. Reservoir bag and rubber test lungs may not inflate fully or over-inflate, causing erroneous results.

III. TESTING AFTER STORAGE

The following procedures should be used after the Magellan-2200, Model 1 Anesthesia Machine has been stored for **6 MONTHS OR LONGER.**

1. Set the machine up and prepare for Bench Testing by placing all components needed on the machine as though preparing for actual use.
2. Use the Pre-Use Checklist and verify that all components are ready for use.
3. Inspect the machine for gas leaks, such as the high-pressure gas hoses, gas connectors and pressure-reducing regulators.
4. Allow the machine to function for 30 minutes and re-inspect the device for any discrepancies.
5. If any problems are observed, perform the Annual Maintenance and test procedure to re-qualify the machine and return to storage or service.

IV. SERVICE KIT FOR MAGELLAN-2200 ANESTHESIA MACHINES

Part Number	OEM PN with CAGEC	NSN	Description	Page No. or Drawing No.
A-108	**Annual Services**		**Component Kit consists of:**	
NOTE: The A-108 Kit is comprised of the following components. Individual components may be utilized at any interval without installing the complete Kit.				
A-108.1			Bellows, Latex free	
A-108.2			Tubing Kit with valves	
A-108.3			Vaporizer End Caps	
A-108.4			Manifold Filters and Spacers	
A-108.5			Tweezers for removing Filters and Spacers	
A-108.6			1/16" Allen Wrench	
A-108.7			Squeeze Bulb with Common Gas Outlet Adapter	
A-108.8			Tubing, Color Coded	
A-108.9			Scavenger Tubing with wye and Bellows Adaptor	
A-108.10			Service Manual CD	
A-108.11			Krytox Lubricant Tube, 1/2 oz.	
A-108.12			Yoke-type Regulator Washers	

OTHER COMPONENT SERVICE

1. Vaporizer — Refer to provided Penlon, Ltd. Vaporizer Manual
2. Air Compressors — Refer to provided Vortran, Inc. Air Compressor Manual

APPENDIX: (INDIVIDUAL PAGES)

Subject	Page Number
SPECIFICATIONS FOR MAGELLAN-2200, MODEL -2	13
PROBLEM SOLVING	15
COMPLETE PARTS LISTING OF ENTIRE ANESTHESIA MACHINE	16
GAS FLOW DIAGRAM	21

SPECIFICATIONS

MACHINE DIMENSIONS:		
Height	53.4 cm	23 inches
Depth	53.4 cm	23 inches
Width	43.2 cm	17 inches
Weight	20.4 kg	45 lbs
Machine Materials	Aluminum, brass and plastic	
CASE DIMENSIONS:		
Height	66.0 cm	23 inches
Depth	60.96 cm	24 inches
Width	53.34 cm	17 inches
Weight	121.2 kg 200.5 kg	55 lbs (empty) 100 lbs (machine with accessories)
Case Materials	Polyethylene, dyed green	
Operating Temperature Range	1.6˚ C to 43.3˚ C (35˚ F to +160˚ F)	
Relative Humidity (in use)	30 to 90%, non condensing	
Relative Humidity (storage)	40 to 90%, non condensing	
Required Gas Supply Sources		
• O2 Main and Cylinders	38 to 70 psi (50 psi is optimal)	
• Air and/or Air Compressor	38 to 70 psi (50 psi is optimal)	
• Oxygen Concentrator	3 to 10 psi	
Flowmeter Fresh Gas Flow	1 to above 20 lpm (each flowmeter)	

Oxygen Flush Valve	Recessed, self-closing, push-button, color coded and labeled, provides 45-55 lpm constant flow, while push-button is depressed; may be used sparingly with O2 concentrator as O2 power source
CO2 Absorber System	King Systems KAB-9 (re-fillable) or KAB-1 (pre-filled/disposable)
CO2 Absorber Canister Capacity	400 grams soda lime
Directional Valves	Built in the CO2 Absorber
CO2 Absorber Holding Bracket	Plastic, secured with knob to main frame of machine
Bag-Ventilator Switch/PRV and Scavenger Outlet Port	Hand-operated selector switch and rotating knob for PRV and scavenging outlet
Bellows	Latex free, upward inflating, range from 0 to 1.6 L
Bellows Pressure Relief	Pre-set at 60 cmH2O
Common Gas Outlet	Quick-connect, size indexed
Tubing Circuit	King Systems F-360-61 or any standard anesthesia circle circuit
Gas Pressure Hoses	DISS and thread indexed, female connectors at both ends
Gas Inlet Manifold	DISS and thread indexed, male connectors with one-way valves
Gas Inlet Manifold Filters	Located behind Manifold Air and O2 inlet male connectors
Gas Inlet Pressure Regulators	
• Main supply cylinder	DISS/thread indexed for O2
• Safety back up cylinder	Pin-indexed, yoke mounted for "D" and "E" cylinders for O2
Oxygen and Air Supply Gauges	0-3000 psi range, color coded and clearly labeled
Oxygen Supply Alarms	
• Main and safety back-up	Pneumatically actuated when O2 supply falls below 30psi
• O2 Concentrator	Pneumatically actuated when O2 supply falls below 1 psi
• Alarm power source	9-volt battery located in body of alarm box
• Alarm on/off	Labeled toggle switch located on body of alarm box
Air and O2 Flowmeters	Calibrated and scaled 0-10 lpm, color coded, O2 flowmeter has a fluted control knob for easy identification by touch, alone
Oxygen Concentrator	To power O2 flowmeter only
Air Compressor	May be used to power ventilator and air flowmeter

Oxygen Analyzer/Monitor	OM-25-ME (or equivalent) Galvanic cell sensor, life expectancy 2 years under normal conditions
Oxygen Analyzer Power Source	2 each AA batteries, life expectancy approx. 3000 use hours
Auxiliary O2 Flow Selector	Scaled 0-10 LPM in set increments, used for pre/post anesthesia
Vaporizer	Penlon SigmaDelta Series, bolt (cage) mounted, temperature compensated, very low maintenance
Airway Pressure Gauge	Dual scaled in cmH2O and mmHg, located on front panel of ventilator
Pressure Gauge Tubing	May be attached to bag/vent switch arm or to a point within the patient breathing circuit (operators choice).
Mechanical Ventilator	Pneumatically powered, time cycled, volume constant, volume variable

Minute Volume to Tidal Volume conversion table examples

Minute Volume L/min	Frequency b/min	Tidal Volume ml
4	30	130
4	25	160
8	25	320
8	20	400
8	10	800
10	13	770
12	13	920
12	10	1200
14	10	1400

• Ventilator Pressure Relief	Pre-set to maximum of 60 cmH2O located in main vent box
• Pressure Relief Valve	Preset to 60 cmH2O
Ventilator Gas Power Requirements	40 to 70 psi, 50 psi optimal Use toggle switch to select gas source
Waste Gas Scavenger	Positive and negative relief valves, 1 L reservoir bag, vacuum control knob

Total Machine Gas Leakage	**@ 30 cmH2O**	-0- ml/Min
	@ 80 cmH2O	100 ml/min
Internal System Compliance	**@ 20 cmH2O**	1.1 ml/cmH2O
	@ 40 cmH2O	1.3 ml/cmH2O
Internal System Resistance	**@ 1.0 L/sec gas flow**	4.11 cmH2O
	@ 0.5 L/sec gas flow	1.80 cmH2O
APL Valve Pressure Drop	**@ 3.0 L/min gas flow**	0.12 cmH2O
	@ 30 L/min gas flow	1.03 cmH2O

PROBLEM SOLVING GUIDE

PROBLEM	SOLUTION
Low O_2 Pressure Alarm Activates	• Check main pipeline O_2 gas supply and the emergency O_2 backup cylinder by observing the gas pressure gauges. Resolve by ensuring adequate pipeline and cylinder O_2 supplies are adequate and are attached to anesthesia machine.
Soda Lime in absorber canister changes color from white to blue	• Replace soda lime in canister
Reservoir Bag does not inflate	• Check Bag/Vent Switch for "vent" position • Check PRV Control Knob for "closed" position • Check entire tubing circuit for leaks
Oxygen Sensor does not calibrate	• Check O_2 supply and O_2 Pressure Gauge to ensure O_2 is available • Check O_2 sensor to ensure proper seating in "tee" adapter • Check that opposing (Air or O_2) flowmeter is OFF
Ventilator does not cycle	• Check Air or O_2 gas power supply for 40-70 PSI on pressure gauges • Check Vent Power Selector Switch in Air or O_2 position • Check expiratory time control to ensure settings • If O_2 is selected for power, check O_2 Power Selector Toggle Switch and ensure it is in the High Pressure Position
Bellows do not evenly expand or deflate	• Check top white plastic ring for proper lubrication
Bellows holds pressure during expiratory phase	• Inspect relief valve at base of bellows for debris
Water particles appear in air flowmeter flowtube	• Insure that water trap is instaled on air inlet located on the back of the gas manifold
Unwanted postive pressure is indicated on pressure gauge during end-exhalation	• Remove PEEP valve from system and check for kinks at ET tube/patient tubing circuit

PRE USE CHECKLIST

See Operators Manual

PART LIST FOR MAGELLAN-2200, MODEL-1

Listed by Assembly Section, in Bold Type. NOTE: Some numbers are repeated as these are used in additional assembly.

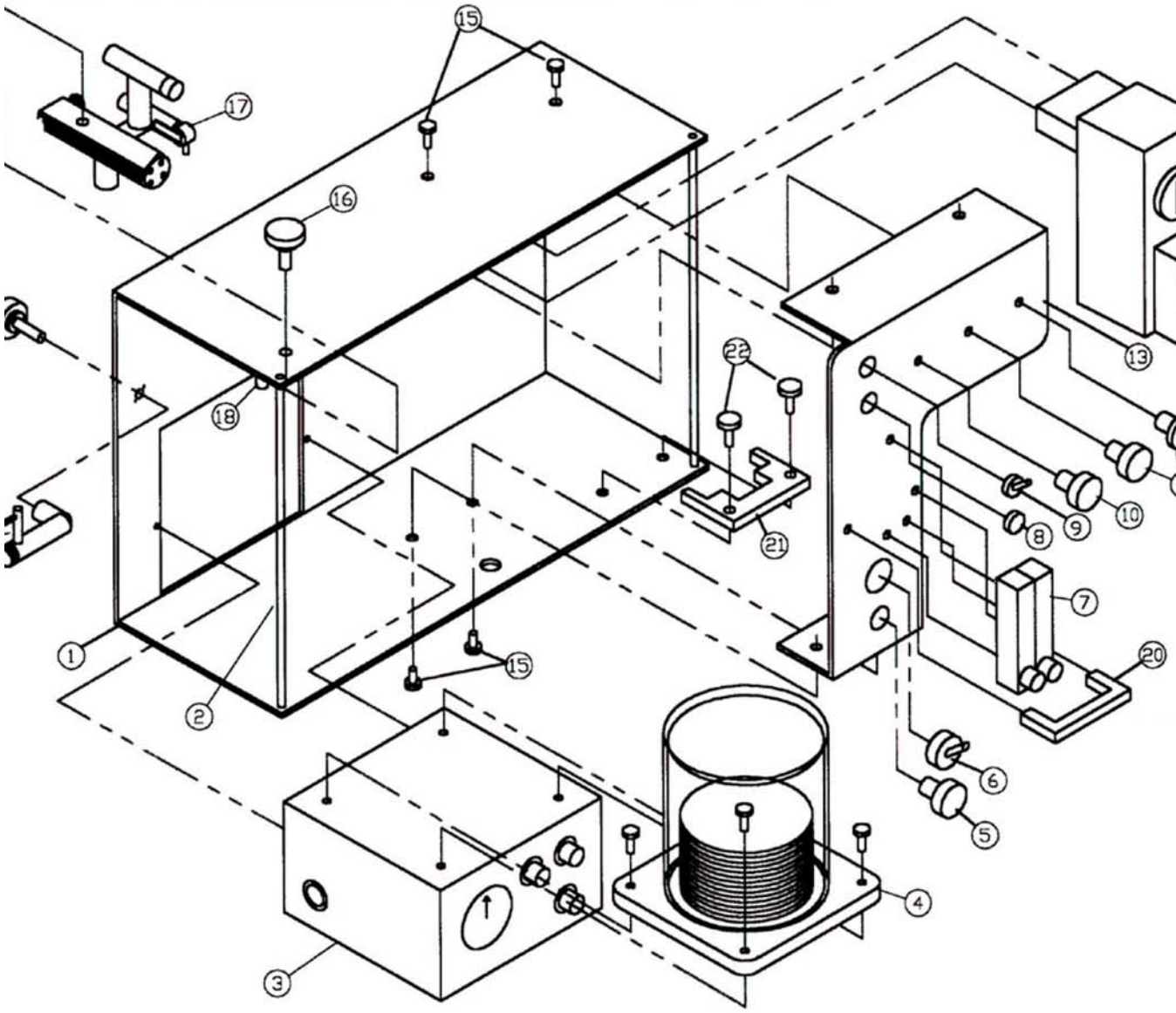
PART NO.	NSN	DESCRIPTION	PAGE NO.
1.0		"L" Frame, Aluminum with 8-32" Brass Mounting Screws (4 each)	19
2.0		Flowmeter Pair, Air and Oxygen with Holding Nuts	19
2.1		1/8" Hose Barb	20
2.2		Hose Connector, Locking, Straight	
2.3		Knob, Green, Fluted for Oxygen Flowmeter	20
2.4		Knob, Black, for Air Flowmeter	20
3.0		Common Gas Outlet Body and Holding Nut	19
3.1		Common Gas Outlet Coupling Insert	12 (Ops)
4.0		Oxygen Flush Button Assembly	19
4.1		Gas Actuator Assembly	
2.1		1/8" Hose Barb	20
4.3		1/8" Hose Connector, Locking, 90 degree	
5.0		Ventilator On/Off Toggle Switch with Holding Nut	19
4.3		1/8" Hose Connector, Locking, 90 degree (3 each)	
6.0		High Pressure O2/O2 Concentrator Toggle Switch with Holding Nut	19
4.3		1/8" Hose Connector, Locking, 90 degree	
2.2		1/8" Hose Connector, Locking, straight (2 each)	
7.0		Air Pressure Gauge, Yellow Dial	19
7.1		Female/Female Coupling, 1/8"NPT	
4.3		1/8" Hose Connector, Locking, 90 degree	
8.0		Oxygen Pressure Gauge, Green Dial	19
7.1		Female/Female Coupling, 1/8" NPT	
4.3		1/8" Hose Connector, Locking, 90 degree	
9.0		Auxiliary Oxygen Flow Selector	19
7.1		Female/Female Coupling, 1/8" NPT	
4.3		1/8" Hose Connector, Locking, 90 degree	
10.0		Main Body Frame, Aluminum	19
10.1		Support Rods, Brass (2 each)	19
10.2		1/-20 Rod Screws, Brass (4 each)	19
10.3		Dowel Pin for B/V Switch Mounting, Brass with -20 B rass Screw	19
2.1		1/8" Hose Barb, O2 Concentrator Inlet	
7.1		Female/Female Coupling, 1/8" NPT	
7.2		1/8" Hose Connector, Locking "Y" Outlet	
11.0		Gas Manifold Body	20
11.1		DISS Adapter, Air, with one way valve	4
11.2		Spacer, length specific, retains bronze filter	4
11.3		Bronze Filter, cone shaped	4
11.4		DISS Adapter, Oxygen, with one way valve (2 each)	4
11.5		Spacer, length specific, retains bronze filter (2 each)	4
11.3		Bronze Filter, cone shaped (2 each)	4
2.2		Hose Connector, Locking, Straight (2 each)	4

PART NO.	NSN	DESCRIPTION	PAGE NO.
7.2		1/8" Hose Connector, Locking, "Y" Outlet (3 each)	
2.2		Hose Connector, Locking, Straight (2 each)	4
11.6		Nylon Screw Plug	4
12.0		Ventilator Container Main Body	20
12.1		Container Front Plate	20
12.2		Container Back Plate	20
12.2-A		Container, Top Plate, Bellows Body Attachment Part	20
12.30		Semi-Locking Control Knobs, (3 ech) Insp Flo/Insp Time/Expir Time	18
13.0		Bellows Assembly Complete	19
13.1		Clear Plastic Bellows Cover	6
13.2		Latex-Free Rubber Bellows	6
13.3		Knob-Screws to hold Bellows Assembly to Ventilator Cover Plate (4 each w/nuts)	6
14.0		Bag/Vent Switch/Pressure Relief Valve/Scavenger Outlet	19
14.1		B/V Switch Support Arm w/ Connectors for Reservoir Bag/CO2 Canister Tube	19
14.2		Pressure Gauge Tubing Connector, w/one way valve	8 (Ops)
15.0		CO2 Absorber Support Arm	8 (Ops)
15.1		1/8 x 1/2" Holding Knob and Screw	8 (Ops)
16.0		Scavenger, Waste Gas	11 (Ops)
16.1		Scavenger Tubing (3 ea) and "TEE" Adapter	11 (Ops)
16.2		Reservoir Bag, 1 Liter	11 (Ops)

PART NO.	NSN	DESCRIPTION	PAGE NO.
17.0		Bulb, Squeeze/Hi-Lo Pressure Check w/ CGO Adapter and Tubing	11 (Ops)
18.0		Alarm, Low Pressure Mains O2, Container	20
18.1		30 psi, Electric Switch	
18.2		Switch Cover	
18.3		Alarm Beeper	
18.4		Alarm Plunger	
18.5		9-Volt Battery	
19.0		Alarm, O2 Concentrator, Low Pressure, Container	20
19.1		1 psi, Low Pressure Electric Switch	
18.2		Switch Cover	
18.5		9-Volt Battery	
23.0		Vaporizer Retainer, Aluminum	20
23.1		Retainer Holding Knob-Screws (2 ea)	20
24.0		Vaporizer, Agent Specific	20
24.1		End Cap, Inlet Port for Tubing from Flowmeters, Size Specific	16 (Ops)
24.2		End Cap, Outlet Port for Tubing from Vaporizer to CGO	16 (Ops)
24.3		Cagemount Assembly, Backbar and Holding Knobs	16 (Ops)
25.0		Manual, Operator and Service on CD25.1	
25.1		Penlon Vaporizer Manual	
25.2		Set-Up Card, Pictorial	9
25.3		Pre-Use Checklist Card	9
26.0		Oxygen Pressure Reducing Regulator, Yoke Mount	6 (Ops)

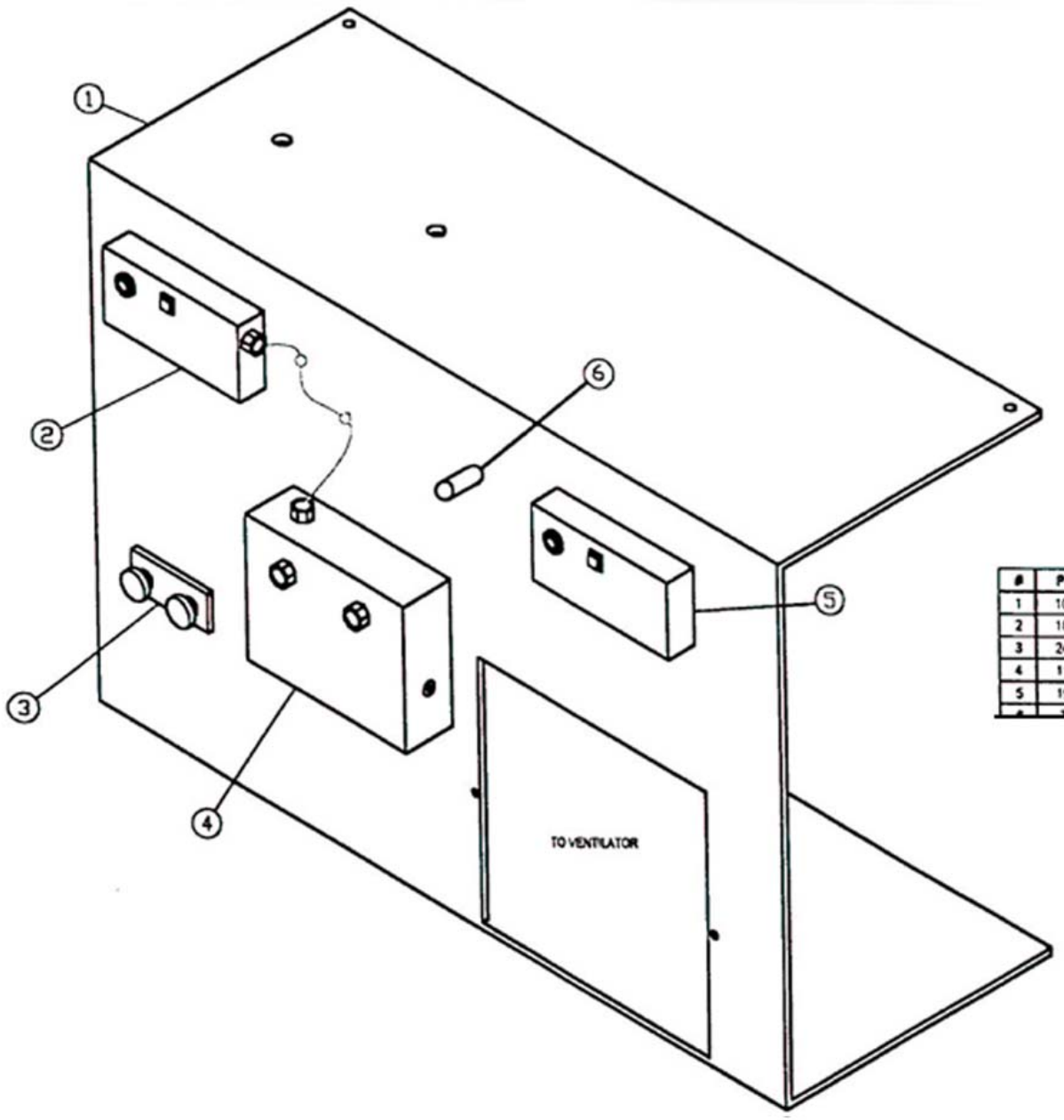
PART NO.	NSN	DESCRIPTION	PAGE NO.
26.3		Oxygen High Pressure Hose, Green, 24" length	
26.4		Oxygen High Pressure Hose, Green, 15' length	6 (Ops)
26.5		Air High Pressure Hose, Yellow, 15' length	6 (Ops)
A-101		Air Compressor, Vortran HP-70	18 (Ops)
A-102		Water Trap for Gas Manifold, Air Inlet Connection	7 (Ops)
A-103		Carrying Case, Air Compressor	
A-104		Carrying Case, Magellan-2200 Anesthesia Machine	5 (Ops)
A-105		Oxygen Cylinder Mount for Carrying Case	5 (Ops)
A-106		Aluminum Trolley for Magellan-2200 Anesthesia Machine	
A-107		Oxygen Analyzer/Monitor with Sensor	11 (Ops)
A-108		Oxygen Analyzer Sensor Replacement	11 (Ops)
A-108		Oxygen Analyzer TEE Adapter	11 (Ops)
A-109		PEEP Valve, Magnetic	20 (Ops)
A-110		Mapleson/Jackson-Reese CGO Adapter	
A-111		Service Kit, Annual Maintenance	12

MAGELLAN-2200 ANESTHESIA MACHINE – FRONT



#	P/N	DESCRIPTION
1	100	Main Frame
2	101	Roos, Support, Steel
3	120	Ventilator
4	131	Bellows
5	3.0	Common Gas Outlet
6	5.0	Vent Power Toggle Switch
7	2.0	Flow Meter Pack, Air & Oxyge
8	4.1	Oxygen Flush Button
9	6.0	HVLC O_2 Pressure Toggle Swi
10	7.0	Air Pressure Gauge
11	8.0	Oxygen Pressure Gauge
12	9.0	Oxygen Auxiliary Flow Selecto
13	1.0	"L" Frame
14	24.0	Vaporizer
15	1.1	"L" Frame Securing Screws
16	14.2	Bag/Vent Switch Absorber Arr
17	14.0	Bag/Vent Switch Assembly an
18	18.3	Dowel Pin Guide for B/V Switc
19	15.0	CO_2 Absorber Support Arm
20	2.4	Flow Meter Bar
21	23.0	Vaporizer Retainer
22	23.1	Vaporizer Retainer Screws

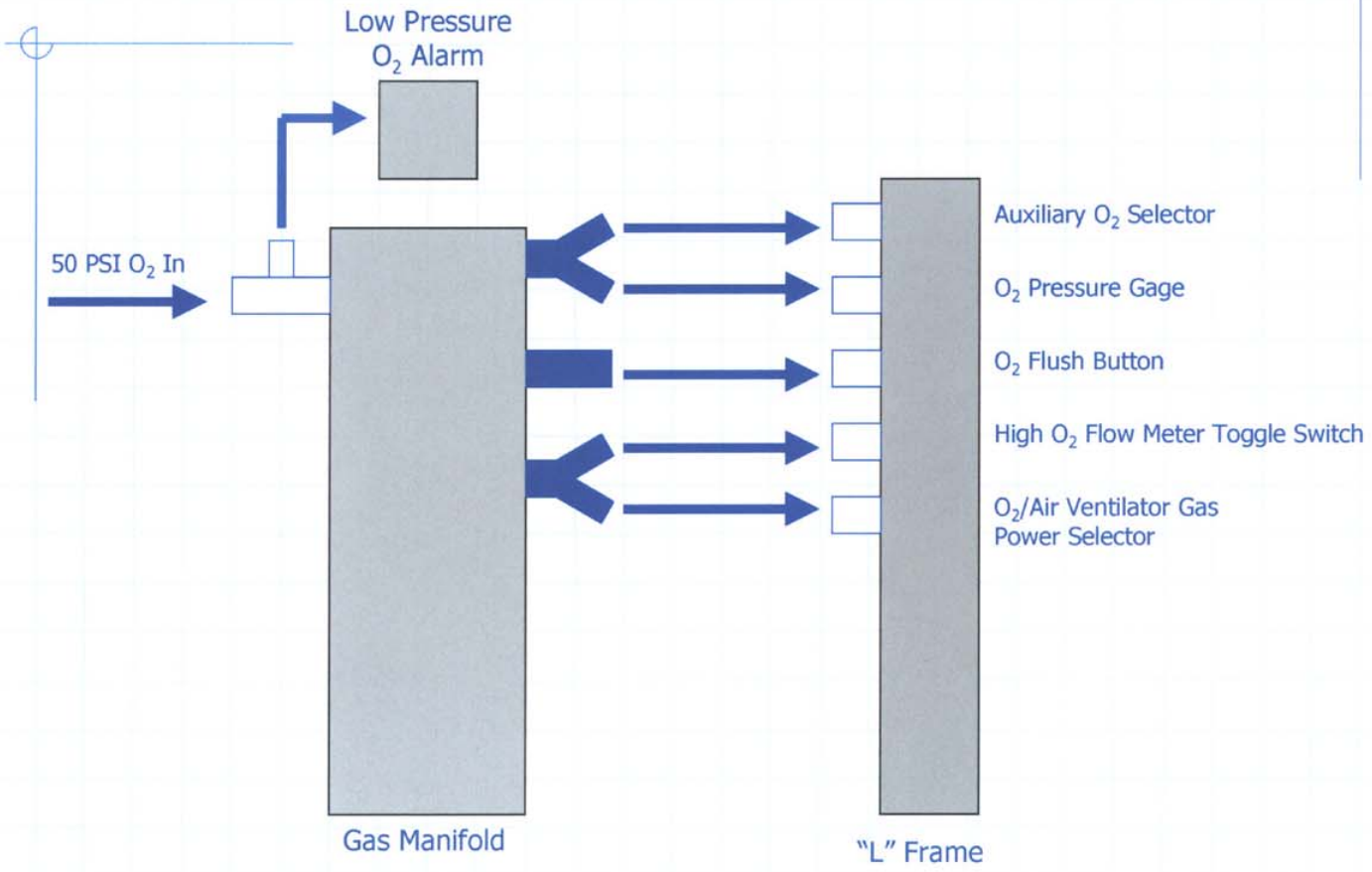
MAGELLAN-2200 ANESTHESIA MACHINE – BACK



#	P/N	DESCRIPTION
1	10.0	MAIN BODY FRAME
2	18.0	MAIN LOW PRESSURE OXYGEN A
3	24.5	VAPORIZER HOLDING SPACER & SECUR
4	11.0	GAS MANIFOLD, MAIN AIR & OXY
5	19.0	O2 CONCENTRATOR LOW PRESSUR

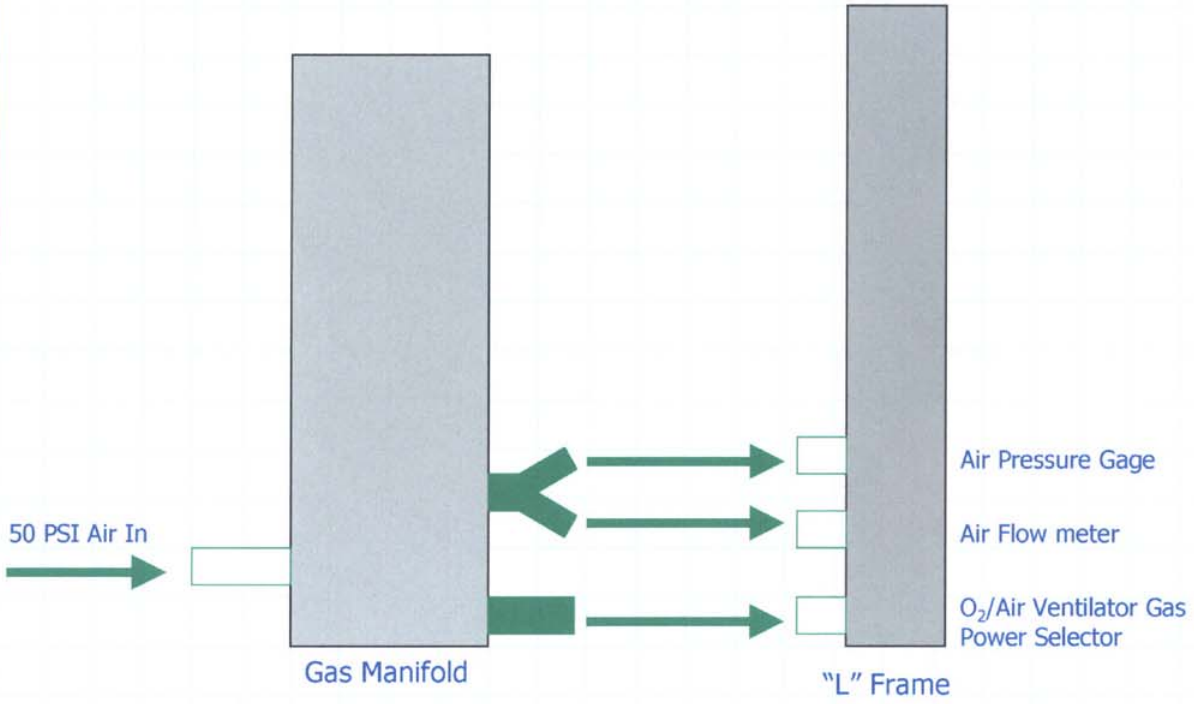
GAS FLOW DIAGRAM I

O_2 Flow from Gas Manifold to "L" Frame



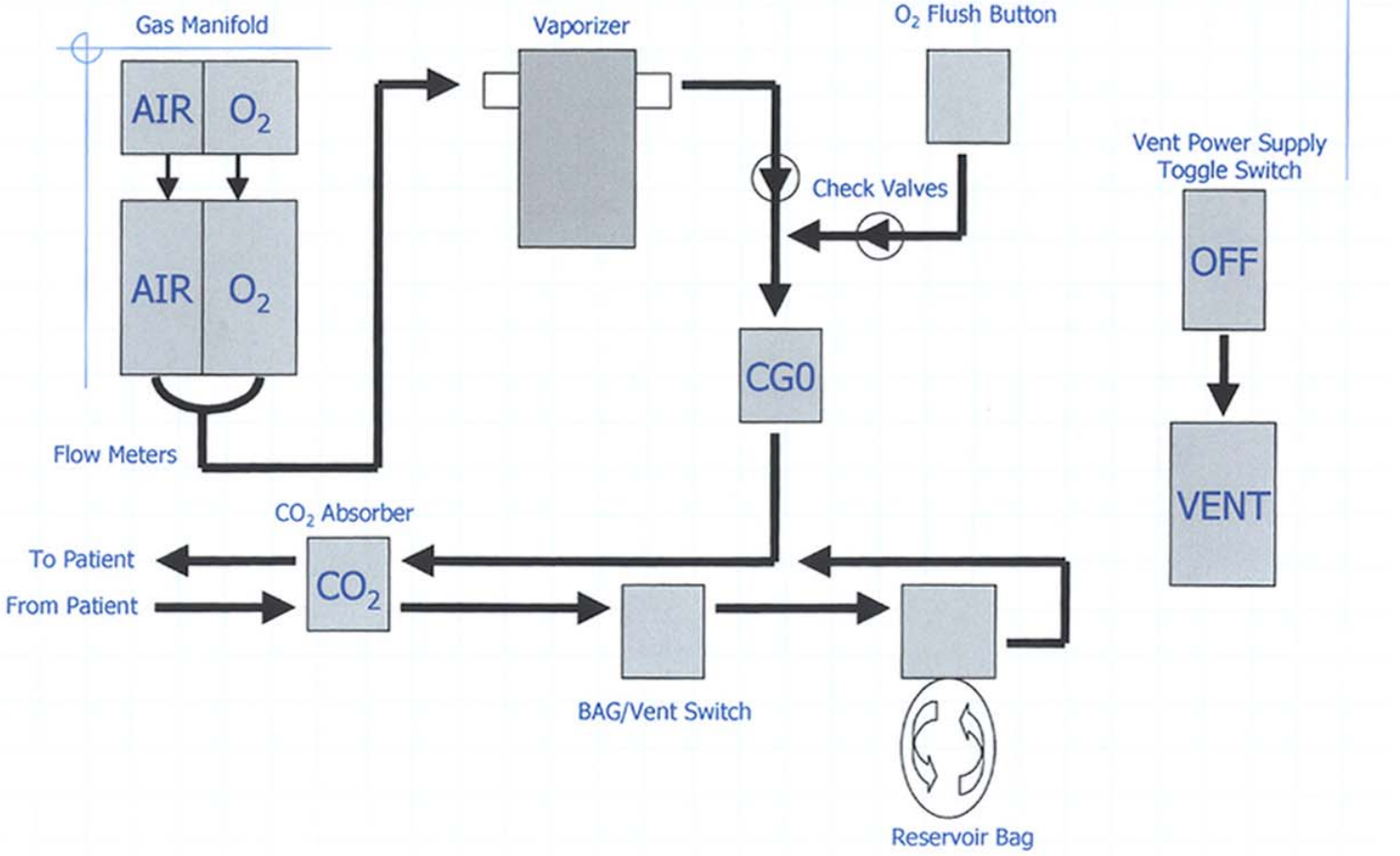
GAS FLOW DIAGRAM II

Air Flow from Gas Manifold to "L" Frame



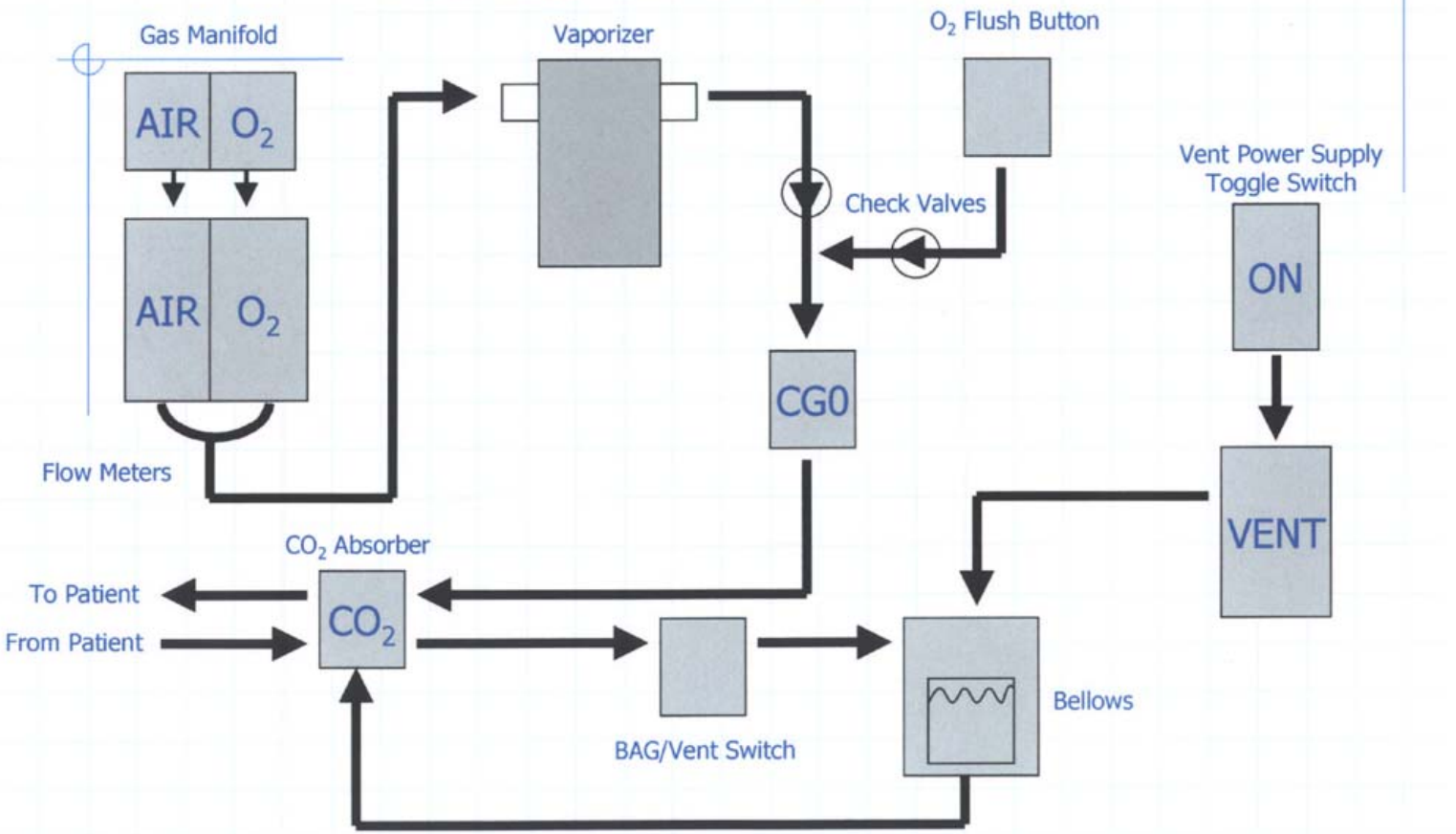
GAS FLOW DIAGRAM III

Air/O_2 From Flow Meters to Common Gas Outlet (CG0)
BAG/Vent Switch on "BAG" Position



GAS FLOW DIAGRAM IV

Air/O_2 From Flow Meters to Common Gas Outlet (CG0)
BAG/Vent Switch on "Vent" Position



GAS FLOW DIAGRAM V

Gas Flow From O_2 Concentrator to O_2 Flow Meter